CLAIMS

What is claimed is:

1. A process to prepare nano-size Zeolite A comprising the steps of:
   a. preparing a precursor mixture comprising sodium, silica, and alumina, wherein the proportions of sodium, silica, and alumina are those required to produce Zeolite A, to form a solid precursor;
   b. isolating the solid precursor from step a);
   c. combining the solid precursor from step b) with seed crystals of Zeolite A with agitation in an aqueous alkaline solution containing hydroxide ions at a temperature of about 18°C to about 85°C to form a mixture containing nano-sized Zeolite A crystals; and
   d. optionally separating the nano-sized Zeolite A crystals from the mixture of step c).

2. The process as of Claim 1 wherein the precursor mixture is a non-clear solution.

3. The process as of Claim 2 wherein the precursor mixture is an amorphous aluminosilicate gel.

4. The process as of Claim 3 wherein the precursor mixture is an amorphous aluminosilicate gel prepared from $NaAlO_2$, NaOH, and tetraethoxysilane.

5. The process as of Claim 3 wherein the amorphous aluminosilicate gel is prepared at a temperature of about 70°C to about 100°C.

6. The process as of Claim 1 wherein the aqueous alkaline solution is an aqueous solution of $(CH_3)_4NOH$ or NaOH.

7. The process as of Claim 6 wherein the aqueous solution of $(CH_3)_4NOH$ or NaOH is at a concentration of about 0.5 to about 3.0 molar.

8. The process as of Claim 1 wherein the seed crystals of Zeolite A are particles of less than 500nm.

9. The process as of Claim 8 wherein the seed crystals of Zeolite A are particles of less than 250nm.

10. The process as of Claim 1 wherein the mixture formed in step c) is agitated for about 1 day to about 20 days before proceeding to step d).

11. The process as of Claim 10 wherein the solution formed in step c) is agitated for more than 10 days.

12. A process to prepare nano-size Zeolite A comprising the steps of:

a. preparing a precursor mixture comprising sodium, silica, and alumina, wherein the proportions of sodium, silica, and alumina are those required to produce Zeolite A, to form a solid precursor;

b. isolating the solid precursor from step a);

c. combining the solid precursor from step b) with seed crystals of Zeolite A with agitation in an aqueous alkaline solution containing hydroxide ions at a temperature of about 18°C to about 85°C to form a mixture containing nano-sized Zeolite A crystals;

d. optionally separating the nano-sized Zeolite A crystals from the mixture of step c);

e. adding the nano-sized Zeolite A crystals with agitation from step d) to an aqueous solution of a Na+ salt to form a mixture containing nano-sized Zeolite A crystals; and

f. optionally isolating the nano-sized Zeolite A crystals.

13. The process as in Claim 12 wherein the mixture formed in step e) is agitated for about 1 day to about 20 days before proceeding to step f).

14. The process as of Claim 1 wherein the aqueous alkaline solution additionally contains one or more of a C1-C6 acetone or alcohol.

15. The process as of Claim 14 wherein aqueous alkaline solution additionally contains ethanol.

16. A nano-sized Zeolite A crystal prepared by the process of Claim 1.

17. Non-phosphate detergent builders, thin films, catalysts, and micro-patterns containing the nano-sized Zeolite A of Claim 16.